

The effect of glutamine supplementation on matrix metalloproteinase 2 and 9 activity after exhaustive exercise in male athletes

Abstract

Background and Objective: *Glutamine is the most abundant amino acids in plasma and skeletal muscle and important fuel for immune system cells. It has beneficial anti-inflammatory and antioxidant properties that may be a potentially useful supplement for athletes. The aim of this study was to investigate the effect of glutamine supplementation on the metalloproteinases 2 and 9 activity after exhaustive exercise in healthy males.*

Methods: *In this intervention study, 30 healthy males (15 case =15 and control=15) were randomly assigned into two groups. Glutamine 0.3 gr/ kg of body weight per day with 25 grams of sugar in 250 CC water was given to intervention group for 14 days. Control group received 25 grams of sugar in 250 CC water for 14 days. Fasting blood samples were taken at baseline and at the end of the two weeks of intervention. The subjects underwent exhaustive exercise and then fasting blood samples were taken. Serum levels of TAC, MDA, MMP-9, MMP-2, and hs-CRP were measured. Data were analysed, using descriptive statistics, non-parametric Kolmogorov-Smirnov test and t-test. Level of statistical significance for all tests was $p < 0.05$.*

Results: *Serum levels of MDA was significantly decreased in intervention group at the end of two weeks supplementation ($p = 0.001$). The serum level of hs-CRP in control group was significantly lower than intervention group at the end of two weeks study ($p = 0.027$). In the intervention group, a significant increase in serum TAC was seen after two weeks study ($p = 0.003$). The results indicate that glutamine supplementation for two weeks as well as exhaustive exercise has no significant effect on mean MMP2 and MMP9. After exhaustive exercise, serum levels of MDA and hs-CRP significantly decreased in the supplemented group compared to the control group ($p < 0.05$), but TAC in the intervention group was more than the control group ($p < 0.05$).*

Conclusion: *Glutamine supplementation improved the antioxidant capacity and reduced the oxidative stress at the end of the two weeks intervention and following of exhaustive exercise. These effects may be reduced the inflammatory factors, and also control MMP2 and MMP9 after exhaustive exercise.*

Keywords: *Glutamine, Oxidative stress, inflammatory factors, Exhaustive exercise, Metalloproteinases*